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Bray et al.

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[54] **METHODS OF SEPARATING SHORT HALF-LIFE RADIONUCLIDES FROM A MIXTURE OF RADIONUCLIDES**

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[58] **Field of Search** **423/3, 6, 249; 250/432 PD, 432 R; 376/158, 170, 189**

[56] **References Cited**

PUBLICATIONS

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[57] **ABSTRACT**

The present invention is a method of obtaining a radionuclide product selected from the group consisting of ²²³Ra and ²²⁵Ac, from a radionuclide "cow" of ²²⁷Ac or ²²⁹Th respectively. The method comprises the steps of a) permitting ingrowth of at least one radionuclide daughter from said radionuclide "cow" forming an ingrown mixture; b) insuring that the ingrown mixture is a nitric acid ingrown mixture; c) passing the nitric acid ingrown mixture through a first nitrate form ion exchange column which permits separating the "cow" from at least one radionuclide daughter; d) insuring that the at least one radionuclide daughter contains the radionuclide product; e) passing the at least one radionuclide daughter through a second ion exchange column and separating the at least one radionuclide daughter from the radionuclide product and f) recycling the at least one radionuclide daughter by adding it to the "cow". In one embodiment the radionuclide "cow" is the ²²⁷Ac, the at least one daughter radionuclide is a ²²⁷Th and the product radionuclide is the ²²³Ra and the first nitrate form ion exchange column passes the ²²⁷Ac and retains the ²²⁷Th. In another embodiment the radionuclide "cow" is the ²²⁹Th, the at least one daughter radionuclide is a ²²⁵Ra and said product radionuclide is the ²²⁵Ac and the ²²⁵Ac and nitrate form ion exchange column retains the ²²⁹Th and passes the ²²⁵Ra/Ac.

15 Claims, 8 Drawing Sheets

